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Stereotactic excisional biopsy in nonpalpable breast lesions using the Advanced Breast Biopsy Instrumentation (ABBI) system

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Introduction. The purpose of our study was to analyze the usefulness of the ABBI system as a diagnostic and therapeutic procedure in nonpalpable breast lesions.

Material and method. Since 1998, 93 patients have been qualified for the ABBI procedure. In 67% of cases the procedure was indicated due to a cluster of microcalcifications, and in 33% – due to the presence of a tumor. The operation was performed under local anaesthesia on an outpatient basis.

Results. 18 lesions were found to be malignant and 61 – benign. All the patients with malignant lesions underwent adequate oncological treatment, while patients with benign lesions remained under follow-up control. In three cases of malignant lesions the procedure was regionally curative.

Discussion. We conclude that, in view of the increasing number of early-diagnosed nonpalpable breast lesions, the diagnostic methods used until now do not seem satisfactory. The ABBI system is effective and appears to be promising for the diagnosis and treatment of nonpalpable breast lesions. What is more – in selected cases it may be regionally curative.

Conclusions. The ABBI procedure is a supplementary diagnostic tool used in case of nonpalpable breast lesions. The ABBI procedure is initially, diagnostic, but in selected cases it may be regionally curative.

Stereotaktyczna biopsja wycinająca przy użyciu systemu ABBI w diagnostyce i leczeniu niepalpacyjnych zmian piersi u kobiet

Wstęp. Celem pracy jest ocena przydatności aparatu „ABBI” (z ang. Advanced Breast Biopsy Instrumentation) w diagnostyce i leczeniu niepalpacyjnych zmian piersi u kobiet w materiale Kliniki Nowotworów Sutka Centrum Onkologii-Instytutu w Warszawie.

Materiał i metoda. W latach 1998-1999 zanalizowano grupę 93 kobiet wstępnie zakwalifikowanych do zabiegu. W 67% przypadków wskazaniami było skupisko mikrozwapnień, a w 33% guzek gruczołu piersiowego. Zabieg wykonywany był w warunkach sali zabiegowej kliniki w znieczuleniu miejscowym.

Wyniki. Stwierdzono 18 zmian złośliwych i 61 łagodnych. We wszystkich przypadkach raka sutka wdrożono dalsze leczenie; pacjentki ze zmianami łagodnymi pozostawały pod okresową kontrolą. W trzech przypadkach zmian złośliwych zabieg był miejscowo radykalny.

Dyskusja. Po wstępnej ocenie wydaje się, że wobec narastającego problemu wykrywanych wcześniej subklinicznych zmian gruczołu piersiowego dotychczas stosowana diagnostyka nie jest w pełni wystarczająca. Aparat ABBI jest cennym urządzeniem w diagnostyce ww. zmian piersi, w wyselekcjonowanych przypadkach zabieg może być terapeutyczny.

Wnioski. Aparat ABBI jest cennym uzupełnieniem dotychczas stosowanych metod diagnostycznych niepalpacyjnych zmian gruczołu piersiowego u kobiet. Jest to zabieg diagnostyczny, ale w szczególnych sytuacjach może spełniać warunki zabiegu miejscowo terapeutycznego.

Key words: nonpalpable breast lesions, stereotactic biopsy, breast cancer

Słowa kluczowe: zmiany niepalpacyjne piersi, biopsja stereotaktyczna, rak piersi

Introduction

Breast cancer is the most frequent oncological malignancy in women. Approx. 9500 new cases were recorded in year 1998 in Poland, while mortality reached approx. 4000 cases. The recent years brought the development of early detection of breast cancer— new programs of breast cancer screening are being introduced. As a result of these activities there is a growing problem of the diagnosis of nonpalpable breast lesions. A majority of these lesions appear either in the form of suspicious clusters of microcalcifications or of the disturbances of breast architecture. We undertake diagnostic procedures in case of lesions classified as 3 to 5 acc. to BIRAD classification [1-3].

Diagnostic methods used until now – such as core biopsy, fine needle aspiration or open surgical biopsy – are not considered sufficient [4-6]. In cases of positive or nondiagnostic results open surgical biopsy performed under general anaesthesia is required. This requires a hospitalisation period of two days and, often, the necessity of preparing elderly patients, suffering from coexisting diseases, for general anaesthesia, thus raising the costs and possible complications of the procedure.

Since 1997, the ABBI procedure has been frequently applied in leading oncological centers. Combined with the VAB, the ABBI system fills the gap in diagnostic procedures of nonpalpable breast lesions.

Materials and methods

Between 1998 and 1999 93 women with nonpalpable breast lesions were qualified for excisional stereotactic biopsy using the ABBI system. In 63 cases (67%) the indication for the procedure was a cluster of microcalcifications, while in 30 cases (33%) – the presence of a tumor or architectural disturbances of breast tissue. At the onset of the study, we qualified all lesions pronounced as slightly suspected in radiological examination. Lesions pronounced to be cancer were not qualified.

The ABBI system was installed in our Department of Breast Cancer within the treatment room (Fig. 1). The room itself did not need any serious adaptations, regarding the weight nor the dimensions of the apparatus, nor regarding radiobiological protection. The first ABBI procedures were performed under the supervision of trained staff from the United States.

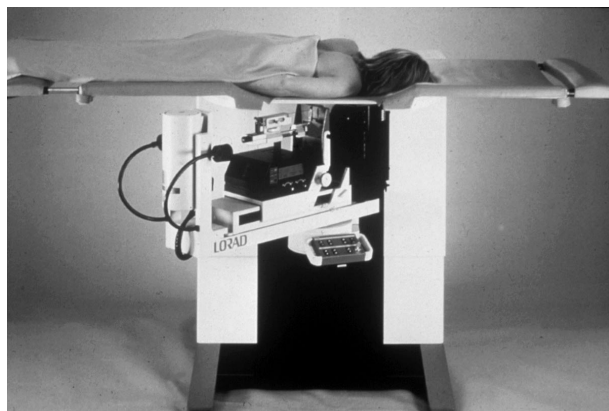


Fig. 1. The ABBI operating table

Two persons are required to perform the ABBI procedure – a surgeon and a trained nurse assistant. The patient is placed on a special table and the breast is positioned in a fixative arm. The procedure consists of two steps. Initially, two stereo images are taken to localise the lesion under digital mammography (± 15 degrees). Computed analysis allows to obtain a precise image of the lesion on screen, regarding its position (including its depth in breast tissue) in all three planes (X,Y,Z). In the second, having performed local anaesthesia with lidocaine 1% (with adrenaline) a wire needle is inserted in to the breast through a small (2 mm) skin incision. Another digital mammography picture is taken; the incision is then widened to approx. 3 cm and an oscillating operating knife is inserted to remove the lesion. At the tip of the operating knife there is the coagulating loop, which may be opened to remove the entire specimen. Haemostasis, skin sutures and elastic dressing of the breast complete the procedure.

Results

In 61 of the 79 women undergoing the ABBI procedure, the lesion was benign. The most frequent diagnosis was focal dysplasia – 37 cases (60%), fibroma – 16 cases (26%), and „radial scar” – 8 cases (14%). All these women are followed up by our outpatient clinic. Mammography of the treated breast is performed 6 months after the ABBI procedure.

In the remaining 18 cases the lesions were found to be malignant. There were 11 cases of DCIS and 7 cases of invasive carcinoma of the breast. All these women underwent adequate oncological treatment. In three cases of DCIS the only treatment required was radiotherapy (satisfactory healthy tissue margins around the lesion). The remaining patients (with either DCIS or invasive cancer) underwent surgery – modified radical mastectomy, simple mastectomy or breast conserving treatment was performed depending upon the technical possibilities and the preferences expressed by the patient.

At the introduction of the ABBI procedure we found the localisation of the lesion to be the most difficult phase; the adequate use of the operating arm also caused some difficulty. Nowadays, the procedure lasts less than 15–20 minutes. The operating phase and the treatment of the wound last no more than 10 to 15 minutes.

Among the 93 women who were qualified for ABBI diagnostics, in 14 cases we did not manage to complete the procedure. In eight cases the lesion was situated too close to the chest wall. In two cases it was located too high within the upper external quadrant of the breast. Both the latter and the former situation cause a high risk of chest wall damage. In four cases, despite taking serial mammographic images of the suspected region of the breast we did not manage to locate the lesion. In all these cases open surgical excisional biopsies were performed.

We did not observe any intraoperative complications. In two cases we observed postoperative haematoma of the wound – not requiring surgical treatment. In one case local infection of the wound was observed several days after the intervention, and was satisfactorily treated with an antibiotic.

Discussion

Considering the fact that the number of nonpalpable breast lesions is growing there is a need for an effective tool for their diagnosis. More DCIS are being detected. Mammographically they are usually manifested as clusters of microcalcifications. This eliminates fine needle aspiration biopsy under ultrasound. Core biopsy under mammography allows to diagnose the lesion, but does not offer the possibility of curative treatment. The patient has to be operated yet again [6, 7, 8]. Severe problems arise in patients not fit for general anaesthesia. The localisation and excised under local anaesthesia, but it may not always be possible.

In selected cases the ABBI system may be used as a diagnostic tool and, at the same time, be regionally curative [9, 10, 11]. In our material the ABBI procedure was regionally radical in three cases of DCIS. The histological reports of these three patients revealed that there was a satisfactory margin of healthy breast tissue around the malignant lesions. These patients underwent radiotherapy alone [12, 8].

The ABBI procedure is well tolerated. In literature one may find a list of contraindications to ABBI such as: body weight above 130 kg., degenerative disorders of the pectoral spine or circulatory disorders which do not allow the patient to remain in a prone position for approx. 40 minutes.

The procedure itself is safe, practically no complications are observed during the procedure. The cosmetic effect of the scar is judged to be very good [13, 14].

The ABBI system is expensive. However, in the United States the ABBI procedure is two to three times cheaper than open surgical biopsy.

Conclusions

1. The ABBI is an effective tool in the management of suspicious nonpalpable breast lesions.
2. The ABBI is a diagnostic procedure, but in a selected cases it may be regionally curative.

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